Metacognition and Classroom Instruction

Mary Ann Wham
Northern Illinios University

WESTERN MICHIGAN UNIVERSITY
**Dorothy J. McGinnis
Reading Center and Clinic**

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Mary Ann Wham

Northern Illinois University
DeKalb, Illinois

Recent research in the fields of education and psychology has focused attention on children's introspective knowledge about their own cognitive operations. The bulk of the research has centered on what readers do to understand and learn from text (e.g., Brown, Campione and Day, 1981; Hare and Smith, 1982; Paris and Lipson, 1982) and is presented from the perspective of metacognition. A definite distinction exists between cognition and metacognition. Generally speaking, cognition refers to the intellectual functioning of the human mind and the ability to use one's knowledge through such activities as remembering, comprehending, focusing attention and processing information (Babbs and Moe, 1983). Metacognition refers to awareness and conscious control over these skills (Stewart and Tei, 1983). Metacognition is the ability to monitor one's cognition and has been described as thinking about thinking (Babbs and Moe, 1983).

Investigators have recently concluded that metacognition plays an important role in oral communication of information, oral persuasion, oral comprehension, writing, and language acquisition. Metacognitive skills involve self-awareness and self-control and when employed, lead to efficient reasoning (Flavell, 1979).

According to Brown (1982), there are two forms of metacognition that have been extensively examined by researchers. First, there is the learners' knowledge about various aspects of their learning situations and about their own abilities as learners. If students are aware of what is needed to effectively handle a learning task, they can initiate the appropriate behaviors in order to adequately meet the demands of the situation. Conversely, students

who are unaware of their abilities and the intricacies demanded by the task at hand, can hardly be expected to complete the task in a manner that will increase their knowledge base.

The second form of metacognition involves self-regulatory behaviors used by active learners. According to Brown (1982), "These indices of metacognition include attempts to relate a new problem to a similar class of problems and to imbue the unfamiliar with the familiar, engaging in means end analysis to identify effective strategies; checking the outcome of any attempt to solve the problem; planning one's next move; monitoring the effectiveness of any attempted action; testing, revising, and evaluating one's strategies for learning and other strategic activities that facilitate learning" (p. 28).

When applied to the reading task, metacognition refers to the readers' ability to monitor their own comprehension of material and to invoke the appropriate skills and strategies necessary for comprehension. The purpose of this article is to review some of the recent research on metacognition and to present some implications for its use in classroom instruction.

Product to Process

Current studies reflect an emphasis on instruction aimed at improving students' self-control and self-awareness of their own learning processes. Indicating a general shift in interest from product to process, Santa and Hayes (1981) suggest that "comprehension is an idea whose time has come." Researchers no longer focus on just the awareness of knowledge phrase of metacognition, but are now just as concerned with control of that knowledge (Brown and Palincsar, 1982).

Brown (1980) describes "debugging" devices, which are skills of metacognition that can be tailored to the purposes of reading. Effective readers engage in a variety of tactics that will ensure efficiency of comprehension. They analyze information only to the depth necessary to meet their current needs. Under the heading "Reading Strategies," Brown lists the following activities:

1. Clarifying the purpose of reading, that is, understanding the task demands, both explicit and implicit

2. Identifying the aspects of a message that are important

3. Allocating attention so that concentration can be focused on the major content area rather than on trivia

4. Monitoring ongoing activities to determine whether comprehension is occurring

5. Engaging in review and self-interrogation to determine whether goals are being achieved

6. Taking corrective action when failures in comprehension are detected

7. Recovering from disruptions and distractions that interfere with learning (p. 456).

Likewise, a person who is deficient in these skills can be said to be lacking metacognitive strategies and appears to lack awareness and control of the cognitive demands of a task (Rinehart and Platt, 1984). Baker and Brown (1980) found that poor readers, young children, and learning-disabled readers demonstrated a lack of metacognitive skills in the following areas:

1. Understanding the purpose in reading

2. Modifying reading strategies for different purposes

3. Considering how new information relates to what is already known

4. Evaluating text for clarity, completeness, and consistency

5. Dealing with failure to understand

6. Identifying the important information in a passage

7. Deciding how well the material has been understood

Many young readers do not know when they have succeeded or failed in comprehending text (Baker, 1979). Younger and poorer readers seem to be less aware of reading as a meaning-getting process and often focus on decoding words rather than on the meaning inherent in the text. This is especially true of readers who have had a heavy emphasis on phonics in their reading instruction. When students read for meaning and view reading as a communication with an author, they are better able to

judge whether or not comprehension is proceeding smoothly. Reading material should make sense, and, if it does not, readers who understand the reading process can take steps to monitor their comprehension. A basic knowledge of the reading process appears to be a necessary part of being a fluent reader and of having control over one's reading (Garner, 1981; Johns, 1980; and Myers and Paris, 1978).

There are noticeable differences between children in second and sixth grades in their knowledge about reading and reading tasks. According to Myers and Paris (1978), sixth graders showed more knowledge of reading as a cognitive process and were more aware of the various aspects of reading. Researchers have documented a lack of knowledge in younger and poorer readers concerning contro of four variables (Armbruster and Echols, 1983). These variables include text, task, learner strategies, and learner characteristics. Readers who are unaware of text structure and the demands presented by the task are better able to modify their own strategies and activate any prior know-ledge or skills necessary to achieve their purpose in reading. Thus, both age and experience affect the development of metacognitive strategies and the ability to use them effec-tively.

Implications for Classroom Instruction

Flavell (1979) stated, "I find it hard to believe that children who do more cognitive monitoring would not learn better than children who do less. I also think that increas-ing the quantity and quality of children's metacognitive knowledge and monitoring skills through systematic training may be feasible as well as desirable" (p. 910). Students can be taught to be aware of what and how they learn (Stewart and Tei, 1983). Through explicit teaching, students can develop reading strategies which promote comprehension and techniques which will remedy comprehension failures. The key is to develop self awareness and control of learn-ing.

According to Stewart and Tei, chilcren need to learn that reading is a meaning-getting process and that the purpose of reading instruction is to provide them with tools for securing this meaning. The knowledge that text conveys important messages is basic to developing curiosity and motivation. Understanding the features of a text is

also an important aspect of comprehension. These features include reading across and down pages, the progression of stories through a book, and the fact that headings and subtitles highlight specific topics. A knowledge of paragraph formation is also essential. Students need to know that paragraphs usually contain a few sentences that convey the essential meaning and that some information is more important than other information.

Children need to be taught strategies to use when comprehension fails and text does not make sense. Stewart and Tei refer to a program of instruction conducted over several months by Paris and Lipson (1982). Using third and fifth graders, Paris and Lipson taught the children metacognitive skills and techniques to control their reading activity. Through explicit teaching, children were taught to be more aware of obstacles to comprehension and to use strategies like rereading and changing pace to improve comprehension. The children read specially-designed passages in which pictures of road signs were drawn. These signs served as reminders for different strategies--for example, "Reduce Speed" for difficult parts and "Yield" to unknown words. The researchers found that these signals helped children recognize obstacles to comprehension and become aware that they must take action when difficulties arise (p. 39-42).

As the ability to summarize material appears to be an effective method of testing one's level of comprehension and retention, Brown, Campione and Day (1980) have identified six basic rules essential to summarization. Their operations are very similar to the macrorules described by Kintsch and Van Dijk (1978) as basic operations involved in comprehending and remembering prose. The rules could be used as an instructional basis for teaching children to summarize and would extend their availability of metacognitive strategies. The rules include the following:

1. Delete unnecessary and trivial material

2. Delete material that is important, but redundant

3. Substitute a superordinate term for a list of items

4. Substitute a superordinate action for a list of components of that action (Ex.: "John went to London" for "John left home")

5. Select a topic sentence as this is the author's summary of the paragraph

6. If there is no topic sentence, invent your own

(p. 17)

Other teacher-directed comprehension aids are also quite valuable for high school students involved in content area reading. Vacca (1981) describes constructing pattern guides for students. These guides serve to develop text structure awareness and aid students in interpreting the author's purpose. Students learn from one another as they piece together the relationships that exist within the predominant patterns of the text.

According to Vacca, the following teaching sequence works well in content classes and promotes the metacognitive construct that "knowing why leads to knowing how" (p. 11).

1. Examine a reading selection and decide upon the predominant pattern used by the author.

2. Discuss this pattern and how to interpret the author's meaning as part of the total lesson.

3. Provide guidance in the process of perceiving organization through a pattern guide, followed by small-group, whole-class discussion.

4. Provide assistance in cases where students have unresolved problems concerning either the process or the content under discussion, or both.

The pattern guide itself tears the text organization apart. The students' task, then, according to Vacca, is "really that of piecing together the relationships that exist within the predominant pattern" (p. 146).

A Caution Concerning Process vs. Product

An interesting caution about metacognitive training for children has been presented by Kendall (1982) who states that "teachers who believe that students' conscious awareness of the rules they are applying or strategies they are using will ensure success may misguide their students (p. 10). Kendall is concerned that in their enthusiasm over metacognition, teachers will, perhaps, teach students about metacognitive skills rather than lead students

to use these skills. Stated another way, process may become more important than product. This would not be an entirely new occurrence in education. As an example, an enthusiasm for phonics has often led teachers to overemphasize phonic rules and "sounding out" to the detriment of gaining meaning from the text. Requiring students to demonstrate conscious awareness of their comprehension strategies should not be necessary. Instead, according to Kendall, teachers should help students focus on meaning and, through modeling, provide guided practice and opportunities for using the various comprehension monitoring strategies. If these focuses are developed during the earlier grades, most students will become active, successful readers.

REFERENCES

Armbruster, B. and Echols, C. (1983) The Role of Metacognition in Reading to Learn: A Developmental Perspective (Tech. Rep. #40). Urbana: Univ. of Ill. Center for the Study of Reading.

Babbs, P. and Moe. A. (1983). "Metacognition: A Key for Independent Learning from Text." The Reading Teacher, 36(4), 422-426.

Baker L. (1979). "Comprehension Monitoring: Identifying and Coping with Text Confusions." Journal of Reading Behavior, XI (4), 369-373.

Baker, L. and Brown, A. L. (1980). Metacognition Skills and Reading (Tech. Rep. #188). Urbana: Univ. of Illinois Center for the Study of Reading.

Brown, A. L. (1982) "Learning How to Learn from Reading" In J. Langer and M. Trika (eds.) Reader Meets Author/ Bridging the Gap. Newark, DE: IRA.

-----(1980). "Metacognitive Development in Reading." In R. J. Sprio: B.C.Bruce; and W.F.Brewer (eds.) Theoretical Issues in Reading Comprehension. Hillsdale, NJ: Erlbaum.

Brown, A.L, Campione, J.C.; and Day J. (1980). "Learning to Learn: On Training Students to Learn from Text." Educational Researcher, 10, 14-21.

Brown, A. & Palincsar, A.S. (1982). Inducing Strategic

Learning from Texts by Means of Informed Self-Control Training. Combridge, MA: Bolt, Beranek and Newman, Inc.: Urbana, IL: Ctr. for Study of Rdg.

Falvell, J. (1979). "Metacognition and Cognitive Monitoring." American Psychologist, 34, 906-911.

Garner, R. (1981). "Monitoring of Passage Inconsistency Among Poor Comprehenders: A Preliminary Test of the 'Piecement Processing Explanation.'" Journal of Educational Research, 74, 159-162.

Hare, V.C. and Smith, D.C. (1982). "Reading to Remember: Studies of Metacognitive Reading Skills in Elementary School-aged Children." Journal of Educational Research, 75, 157-164.

Johns,J.L. (1980). "First Graders' Concepts about Print." Reading Research Quarterly, 15, 529-549.

Kendall, J. R. (1982). Metacognition from the Historical Context of Teaching Reading. (Tech. Rep. #263). Urbana: Univ of Ill. Ctr for the Study of Reading.

Kintsch, W. and van Dijk, T. A. (1978). "Toward a Model of Text Comprehension and Production." Psychological Review, 85(5), 263-394.

Myers, M. and Paris, S. (1978). "Children's Metacognitive Knowledge about Reading." Journal of Educational Psychology, 70, 680-690.

Paris, S. and Lipson, M. (1982). "Metacognition and Reading Comprehension." Research colloquium presented at the IRA annual convention, Chicago, IL.,39-42.

Rinehart, S. and Platt, J. (1984). "Metacognitive Awareness and Monitoring in Adult and College Reader." Forum for Reading, 15(2), 54-62.

Santa, C.M. & Hayes, B.L. (1981). Children's Prose Comprehension: Research and Practice. Newark, DE: IRA, 193.

Stewart, O. & Tei, E. (Oct. 1983). "Some Implications of Metacognition for Reading Instruction." Journal of Reading, 36-43.

Vacca, R. T. (1981). Context Area Reading, pp. 11, 146. Boston, MA: Little, Brown and Co.